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Anthelmintic effects of sainfoin against different cattle nematodes may be linked to concentration of condensed tannins in different gut compartments

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Objectives: We investigated the potency of a forage legume (sainfoin, *Onobrychis viciifolia*) against gastrointestinal nematodes in relation to concentration of condensed tannins (CT) along the digestive tract in cattle.

Methods: Fifteen 2-4 month-old Jersey calves were divided into two groups and fed either sainfoin pellets (SF, n=9) or starter feed pellets and ryegrass hay (CO, n=6). Diets were balanced for crude protein and net energy during the entire study. Then, calves were infected with 10,000 *Ostertagia ostertagi* and 66,000 *Cooperia oncophora* third-stage larvae (L3). The number of eggs per g of dried faeces (FECDM) was followed until 42 days post infection when the calves were euthanized for worm recovery and sampling of digesta for analysis of CT. The HCl-butanol-acetone and *in situ* thiolysis methods were used to assess the CT content and structural composition.

Results: The main finding was a 50 % reduction in adult worm counts for *O. ostertagi* in SF as compared to CO ($p < 0.05$). In contrast no difference was observed between groups for *C. oncophora*. Overall, FECDM was 40% lower in SF compared to CO ($p>0.05$). The CT content was 6.5% of dry matter (DM) in sainfoin pellets and gradually increased along the digestive tract (5.9, 6.6 and 8.1% DM in the abomasum, small intestine and faeces, respectively). However, *in situ* thiolysis indicated more CT in the abomasum and less CT in other locations of the digestive tract. The CT contents for pellets, abomasum, small intestine and faeces were 1.9, 2.2, 0.01 and 0.5% DM, respectively. This suggests that CT become less accessible and reactive to the thiolysis reagent as the feed passes along the digestive tract.

Discussion: Feeding sainfoin significantly reduced the worm burden of *O. ostertagi* in the abomasum where CT are thought to be released from complexes with macromolecules due to acidic conditions. The lack of effect against *C.oncophora* in the small intestine could be related to an apparent unavailability of CT in this gut compartment.